

09704968

=> d his

(FILE 'HOME' ENTERED AT 13:40:13 ON 18 MAR 2004)

FILE 'REGISTRY' ENTERED AT 13:40:21 ON 18 MAR 2004  
STRUCTURE UPLOADED

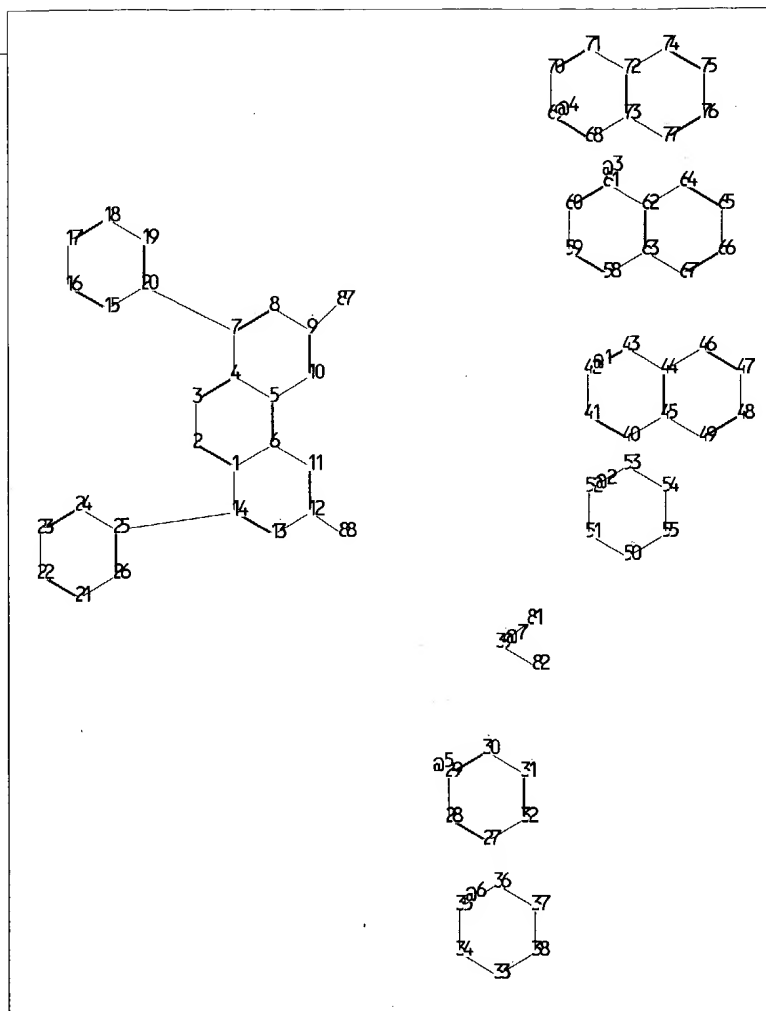
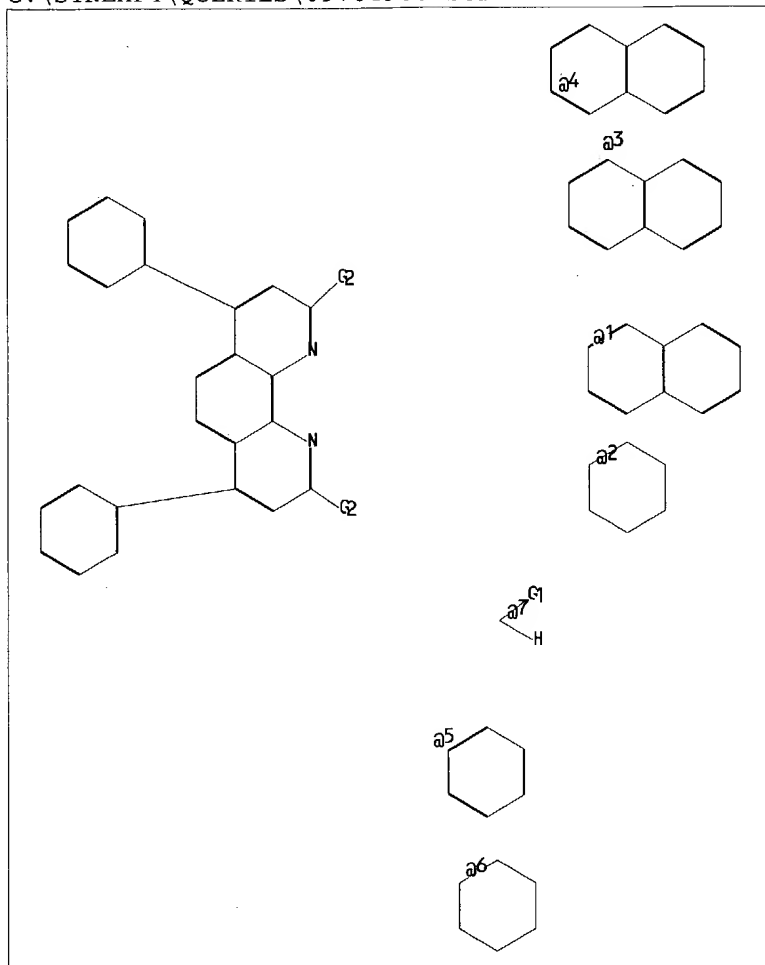
L1  
L2 0 S L1  
L3 28 S L1 SSS FULL

FILE 'CAPLUS' ENTERED AT 13:42:25 ON 18 MAR 2004  
L4 21 S L3

FILE 'REGISTRY' ENTERED AT 13:42:52 ON 18 MAR 2004

FILE 'CAPLUS' ENTERED AT 13:43:31 ON 18 MAR 2004  
L5 12 S L4 NOT (CADMIUM OR ZINC OR COPPER)

=>



chain nodes :

39 81 82 87 88

ring nodes :

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	40	41	42	43	44	45	46	47	48	49		
50	51	52	53	54	55	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74		
75	76	77																						

chain bonds :

7-20 9-87 12-88 14-25 39-81 39-82

ring bonds :

1-2	1-6	1-14	2-3	3-4	4-5	4-7	5-6	5-10	6-11	7-8	8-9	9-10	11-12	12-13	13-14
15-16	15-20	16-17	17-18	18-19	19-20	21-22	21-26	22-23	23-24	24-25	25-26	27-28			
27-32	28-29	29-30	30-31	31-32	33-34	33-38	34-35	35-36	36-37	37-38	40-41	40-45			
41-42	42-43	43-44	44-45	44-46	45-49	46-47	47-48	48-49	50-51	50-55	51-52	52-53			
53-54	54-55	58-59	58-63	59-60	60-61	61-62	62-63	62-64	63-67	64-65	65-66	66-67			
68-69	68-73	69-70	70-71	71-72	72-73	72-74	73-77	74-75	75-76	76-77					

exact/norm bonds :

9-87 12-88 33-34 33-38 34-35 35-36 36-37 37-38 39-81 50-51 50-55 51-52 52-53  
53-54 54-55

exact bonds :

7-20 14-25 39-82

normalized bonds :

1-2	1-6	1-14	2-3	3-4	4-5	4-7	5-6	5-10	6-11	7-8	8-9	9-10	11-12	12-13	13-14
15-16	15-20	16-17	17-18	18-19	19-20	21-22	21-26	22-23	23-24	24-25	25-26	27-28			
27-32	28-29	29-30	30-31	31-32	40-41	40-45	41-42	42-43	43-44	44-45	44-46	45-49			
46-47	47-48	48-49	58-59	58-63	59-60	60-61	61-62	62-63	62-64	63-67	64-65	65-66			
66-67	68-69	68-73	69-70	70-71	71-72	72-73	72-74	73-77	74-75	75-76	76-77				

G1:CH3, [\*1], [\*2], [\*3], [\*4]

G2: [\*5], [\*6], [\*7]

Match level :

1:Atom	2:Atom	3:Atom	4:Atom	5:Atom	6:Atom	7:Atom	8:Atom	9:Atom	10:Atom	11:Atom
12:Atom	13:Atom	14:Atom	15:Atom	16:Atom	17:Atom	18:Atom	19:Atom	20:Atom	21:Atom	
22:Atom	23:Atom	24:Atom	25:Atom	26:Atom	27:Atom	28:Atom	29:Atom	30:Atom	31:Atom	
32:Atom	33:Atom	34:Atom	35:Atom	36:Atom	37:Atom	38:Atom	39:CLASS	40:Atom	41:Atom	
42:Atom	43:Atom	44:Atom	45:Atom	46:Atom	47:Atom	48:Atom	49:Atom	50:Atom	51:Atom	
52:Atom	53:Atom	54:Atom	55:Atom	58:Atom	59:Atom	60:Atom	61:Atom	62:Atom	63:Atom	
64:Atom	65:Atom	66:Atom	67:Atom	68:Atom	69:Atom	70:Atom	71:Atom	72:Atom	73:Atom	
74:Atom	75:Atom	76:Atom	77:Atom	81:CLASS	82:CLASS	87:CLASS	88:CLASS			

09704968

=> d 1-12 bib abs hitstr

L5 ANSWER 1 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
 AN 2003:930086 CAPLUS  
 DN 139:388305  
 TI High-efficiency organic electroluminescent devices containing naphthacene and/or anthracene derivatives  
 IN Ara, Kensuke; Inoue, Tetsuji; Ogawa, Hiromitsu  
 PA TDK Corporation, Japan  
 SO Jpn. Kokai Tokkyo Koho, 258 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003338377	A2	20031128	JP 2003-65672	20030311
PRAI	JP 2002-65472	A	20020311		
OS	MARPAT 139:388305				

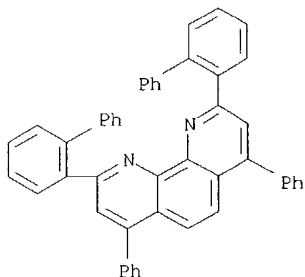
AB The devices, showing high purity of emission color, have electron-transporting layers containing naphthacene and/or anthracene derivs. and electron-injecting layers which may contain phenanthroline derivs. (Markush given). The devices may have host-guest emission layers containing naphthacene derivs. as the host materials satisfying dipole moment  $\leq 1.0$  debye.

IT **625121-77-9**

RL: DEV (Device component use); USES (Uses)  
 (electron-injecting layers; high-efficiency organic LED containing naphthacene and/or anthracene derivs. as carrier transporters)

RN 625121-77-9 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis[1,1'-biphenyl]-2-yl-4,7-diphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 2 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
 AN 2003:874705 CAPLUS  
 DN 139:371627  
 TI Electroluminescent materials based on metal complexes bearing a quadridentate pyridine-based ligand for use as emissive dopants in organic light-emitting devices  
 IN Che, Chi-Ming  
 PA Peop. Rep. China  
 SO U.S. Pat. Appl. Publ., 14 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003205707	A1	20031106	US 2002-137272	20020501
	US 6653654	B2	20031125		
	WO 2003093283	A1	20031113	WO 2003-CN221	20030327

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC,

NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
 GW, ML, MR, NE, SN, TD, TG

PRAI US 2002-137272 A 20020501

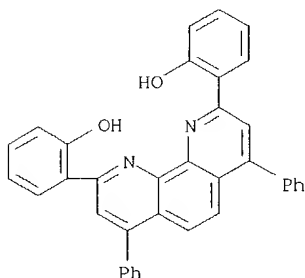
OS MARPAT 139:371627

AB Electroluminescent layers in a heterostructure organic light-emitting device are described which comprise at least a host material and an emissive mol., present as a dopant in the host material, where the emissive mol. is selected from metal complexes bearing a quadridentate ligand containing at least one pyridine or substituted pyridine group. Methods for the preparation of the light-emitting materials are discussed and yellow-emitting electroluminescent devices employing the materials are demonstrated.

IT **553677-75-1P**  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (electroluminescent materials based on metal complexes bearing quadridentate pyridine-based ligand prepared using)

RN 553677-75-1 CAPLUS

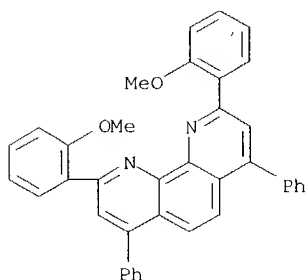
CN Phenol, 2,2'-(4,7-diphenyl-1,10-phenanthroline-2,9-diyl)bis- (9CI) (CA INDEX NAME)



IT **553677-79-5**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (electroluminescent materials based on metal complexes bearing quadridentate pyridine-based ligand prepared using)

RN 553677-79-5 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(2-methoxyphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2003:758034 CAPLUS

DN 139:283131

TI Rhenium compounds for an organic electroluminescent device

IN Christou, Victor; Watkins, Scott Edward

PA Isis Innovation Limited, UK

SO PCT Int. Appl., 29 pp.  
 CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

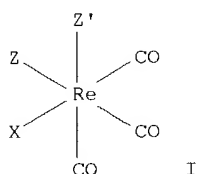
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003079737	A2	20030925	WO 2003-GB1189	20030317

PI W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
 PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, BG, KZ, MD,  
 RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,  
 CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC,  
 NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
 GW, ML, MR, NE, SN, TD, TG

PRAI GB 2002-6169 A 20020315

GI



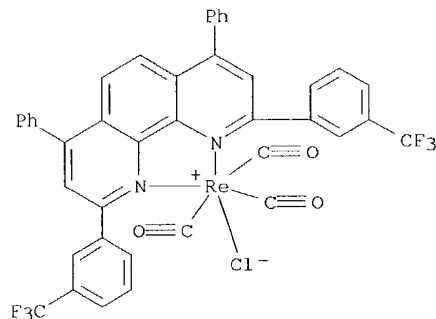
AB An organic electroluminescent device is described which comprises a compound having a skeleton (I): which skeleton can comprise  $\geq 1$  addnl. aromatic rings, wherein each of Z and Z', which may be the same or different, represents a N-containing aromatic ring such that the Z and Z' rings either together form a conjugated system, optionally with  $\geq 1$  addnl. aromatic rings, or  $\geq 1$  of Z and Z' form a conjugated system with  $\geq 1$  addnl. aromatic rings to which Z and Z' is attached, with the proviso that, (a) when the 2 said rings are pyridyl rings and are connected to 1 another ortho to the N atoms then (i)  $\geq 1$  said ring is substituted by  $\geq 1$  electron withdrawing substituent which is a hydrocarbon aryl group or (ii)  $\geq 1$  said ring is fused to another aromatic ring to which the other pyridyl ring is not fused or (iii) the 2 said rings together form a phenanthroline ring system which is substituted by  $\geq 1$  electron withdrawing substituent which is in the 2, 4, 5, 6, 7 or 9 position, or (b) the 2 said rings are such that either (i)  $\geq 1$  of them contains  $\geq 1$  further N atom or (ii) they are fused to another aromatic ring which contains  $\geq 1$  N atom, and X represents an anionic or neutral coligand.

IT 606093-24-7P

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)  
 (preparation and IR and luminescence and NMR spectra and electrochem. redox and electroluminescent device of)

RN 606093-24-7 CAPLUS

CN Rhenium, tricarbonylchloro[4,7-diphenyl-2,9-bis[3-(trifluoromethyl)phenyl]-1,10-phenanthroline- $\kappa N1, \kappa N10$ ]- (9CI) (CA INDEX NAME)



IT 606093-20-3P

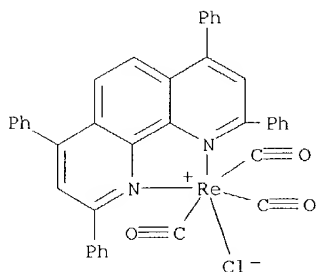
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)

09704968

(preparation and IR and luminescence and NMR spectra and electrochem. redox of)

RN 606093-20-3 CAPLUS

CN Rhenium, tricarbonylchloro(2,4,7,9-tetraphenyl-1,10-phenanthroline- $\kappa$ N1, $\kappa$ N10)- (9CI) (CA INDEX NAME)

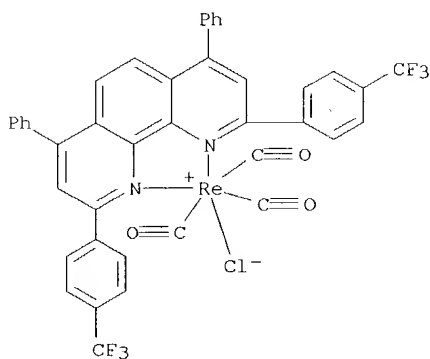


IT 606093-23-6P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and IR and luminescence and NMR spectra and electrochem. redox of)

RN 606093-23-6 CAPLUS

CN Rhenium, tricarbonylchloro[4,7-diphenyl-2,9-bis[4-(trifluoromethyl)phenyl]-1,10-phenanthroline- $\kappa$ N1, $\kappa$ N10]- (9CI) (CA INDEX NAME)

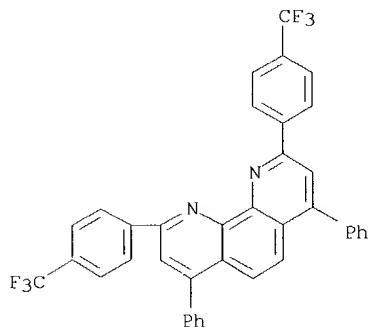


IT 605686-78-0P 605686-80-4P

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and NMR and reaction with rhenium pentacarbonyl chloride)

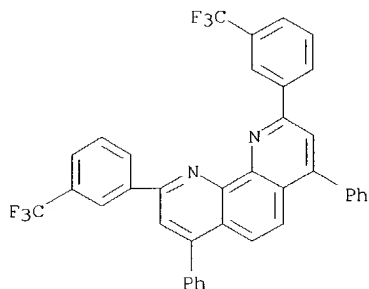
RN 605686-78-0 CAPLUS

CN 1,10-Phenanthroline, 4,7-diphenyl-2,9-bis[4-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)

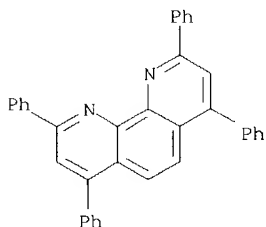


09704968

RN 605686-80-4 CAPLUS  
CN 1,10-Phenanthroline, 4,7-diphenyl-2,9-bis[3-(trifluoromethyl)phenyl]-  
(9CI) (CA INDEX NAME)



IT **51786-73-3**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with rhenium pentacarbonyl chloride)  
RN 51786-73-3 CAPLUS  
CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 4 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
AN 2003:246946 CAPLUS  
DN 139:94233  
TI Structural, photophysical, and electrophosphorescent properties of  
platinum(II) complexes supported by tetradentate N2O2 chelates  
AU Lin, Yong-Yue; Chan, Siu-Chung; Chan, Michael C. W.; Hou, Yuan-Jun; Zhu,  
Nianyong; Che, Chi-Ming; Liu, Yu; Wang, Yue  
CS Department of Chemistry and HKU-CAS Joint Laboratory on New Materials, The  
University of Hong Kong, Hong Kong SAR, Peop. Rep. China  
SO Chemistry--A European Journal (2003), 9(6), 1263-1272  
CODEN: CEUJED; ISSN: 0947-6539  
PB Wiley-VCH Verlag GmbH & Co. KGaA  
DT Journal  
LA English  
OS CASREACT 139:94233  
AB The authors present an examination of the structural and photophys.  
characteristics of [PtL] (H<sub>2</sub>L = 2,9-bis(2'-hydroxyphenyl)-4,7-diphenyl-  
1,10-phenanthroline (1), 6,6'-bis(2''-hydroxyphenyl)-4,4'-bis(tert-butyl)-  
2,2'-bipyridine (2)) that are tetradentate relatives of the quinolinolato  
(q) ligand. These neutral derivs. display high thermal stability  
(>400° in N<sub>2</sub>). While the crystal lattice in 1 consists of  
(head-to-tail)-interacting dimers, mols. of 2 are arranged into infinitely  
stacked planar sheets with possible  $\pi$ - $\pi$  interactions but no close  
Pt...Pt contacts. Complexes 1 and 2 exhibit  
moderately intense low-energy UV/visible absorptions around  $\lambda$  =  
400-500 nm that undergo neg. solvatochromic shifts. Both derivs. are  
highly luminescent in solution at 298 K with emission lifetimes in the  $\mu$ s  
range, and mixed 3[1  $\rightarrow$   $\pi^*$ (diimine)] (1 = lone pair/phenoxide)  
and 3[Pt(d)- $\pi^*$ (diimine)] charge-transfer states are tentatively  
assigned. The excited-state properties of 2 are also studied by  
time-resolved absorption spectroscopy and by quenching expts. with  
pyridinium acceptors to estimate the excited-state redox potential. These  
emitters were employed as electrophosphorescent dopants in multilayer  
OLEDs. Differences between the brightness, color, and overall performance



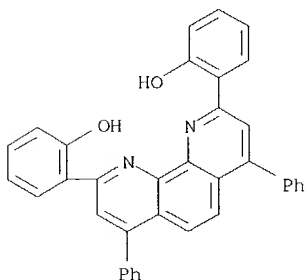
of devices incorporating 1 and 2 are attributed to the influence of the diimine substituents.

IT **553677-75-1P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and complexation with platinum)

RN 553677-75-1 CAPLUS

CN Phenol, 2,2'-(4,7-diphenyl-1,10-phenanthroline-2,9-diyl)bis- (9CI) (CA INDEX NAME)

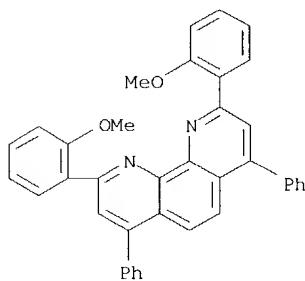


IT **553677-79-5P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and reactant for preparation of bis(2'-hydroxyphenyl)-4,7-diphenyl-1,10-phenanthroline)

RN 553677-79-5 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(2-methoxyphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



RE.CNT 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:747696 CAPLUS

DN 135:311013

TI Write-once optical record medium

IN Oyamada, Mitsuaki; Iwamura, Takashi; Tamura, Shinichiro

PA Sony Corporation, Japan

SO PCT Int. Appl., 24 pp.

CODEN: PIXXD2

DT Patent

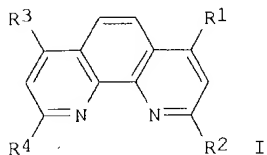
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001074600	A1	20011011	WO 2001-JP2903	20010403
	W: CN, JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	EP 1199184	A1	20020424	EP 2001-917814	20010403
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	US 2002150837	A1	20021017	US 2002-9108	20020422
PRAI	JP 2000-100948	A	20000403		

09704968

WO 2001-JP2903 W 20010403  
OS MARPAT 135:311013  
GI



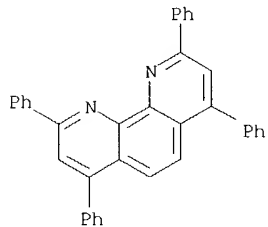
AB A write-once optical record medium comprises a record layer and a light-transmitting protective layer formed in order on a support, and recording and reproduction are performed by irradiating the light-transmitting protective layer with a laser beam of a wavelength of 380-450 nm, wherein the wavelength  $\lambda_{\text{max}}$  at which the light absorption coefficient of the record layer reaches a peak is  $\lambda_{\text{max}} < 370$  nm. The recording layer contains a compd selected from 4,4'-diaminobiphenyls, tris(4-aminophenyl)amines, fullerenes, and I [R1-4 = (un)substituted Ph, naphthyl, biphenyl]. The recording medium shows excellent read-out stability.

IT **51786-73-3**

RL: TEM (Technical or engineered material use); USES (Uses)  
(write-once optical recording medium containing)

RN 51786-73-3 CAPLUS

CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:338138 CAPLUS

DN 134:346298

TI Organic electroluminescent device

IN Kijima, Yasunori; Shibamura, Tetsuo; Asai, Nobutoshi; Tamura, Shinichiro

PA Sony Corporation, Japan

SO Eur. Pat. Appl., 54 pp.

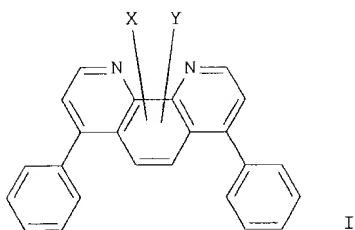
CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1097981	A2	20010509	EP 2000-123744	20001031
	EP 1097981	A3	20030924		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001135482	A2	20010518	JP 1999-312070	19991102
	US 6524728	B1	20030225	US 2000-705192	20001102
PRAI	JP 1999-312070	A	19991102		
OS	MARPAT 134:346298				
GI					



AB Organic electroluminescent devices are described in which a portion (e.g., a hole-blocking layer) contacting the emission region contains a bathophenanthroline derivative are described by the general formula I (X and Y = independently selected H, (un)substituted alkyl, (un)substituted cycloalkyl, (un)substituted aryl, (un)substituted amino, halogen, nitro, cyano, or hydroxyl groups with the restrictions that a H or Me group may not be provided at the 2 or 9 positions and that at least one of the groups is contained at an arbitrary position).

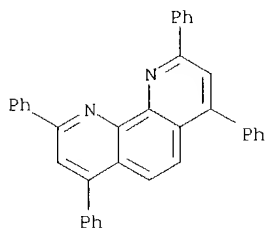
IT **51786-73-3 338732-41-5 338732-42-6**

RL: DEV (Device component use); USES (Uses)

(organic electroluminescent devices with bathophenanthroline derivative hole-blocking layers)

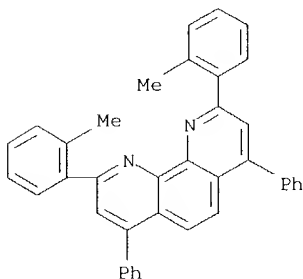
RN 51786-73-3 CAPLUS

CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



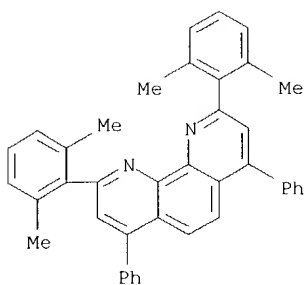
RN 338732-41-5 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(2-methylphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



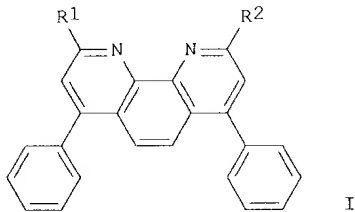
RN 338732-42-6 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(2,6-dimethylphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
 AN 2001:338137 CAPLUS  
 DN 134:346297  
 TI Bathophenanthroline compound and process for preparing same  
 IN Shibamura, Tetsuo; Kijima, Yasunori; Asai, Nobutoshi; Tamura, Shinichiro  
 PA Sony Corporation, Japan  
 SO Eur. Pat. Appl., 64 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1097980	A2	20010509	EP 2000-123668	20001030
	EP 1097980	A3	20030924		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001131174	A2	20010515	JP 1999-312071	19991102
PRAI	JP 1999-312071	A	19991102		
OS	MARPAT 134:346297				
GI					

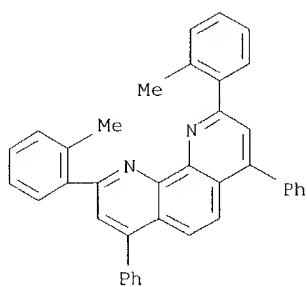


AB Bathophenanthroline compds. are described by the general formula I (R1 and R2 = independently selected linear, branched, or cyclic (un)saturated (un)substituted hydrocarbon groups provided that  $\geq 1$  of R1 and R2 has  $\geq 2$  carbon atoms; or R1 and R2 = independently selected (un)substituted aryl groups). Methods for preparing the compds. are described which entail carrying out a nucleophilic substitution reaction between bathophenanthroline and an appropriate organolithium compound. The compds. may be used as organic layers (e.g., charge transport layers) in electroluminescent devices.

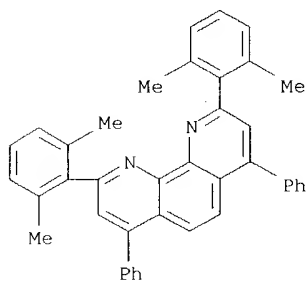
IT **338732-41-5P 338732-42-6P 338734-79-5P**  
**338734-81-9P 338734-82-0P 338734-83-1P**  
**338734-84-2P 338734-86-4P 338734-87-5P**  
**338734-88-6P**  
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)  
 (bathophenanthroline derivs. and their preparation and use in electroluminescent devices)

RN 338732-41-5 CAPLUS  
 CN 1,10-Phenanthroline, 2,9-bis(2-methylphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)

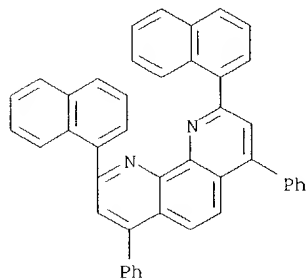
09704968



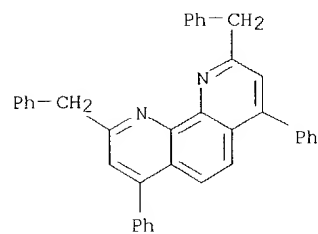
RN 338732-42-6 CAPLUS  
CN 1,10-Phenanthroline, 2,9-bis(2,6-dimethylphenyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



RN 338734-79-5 CAPLUS  
CN 1,10-Phenanthroline, 2,9-di-1-naphthalenyl-4,7-diphenyl- (9CI) (CA INDEX NAME)

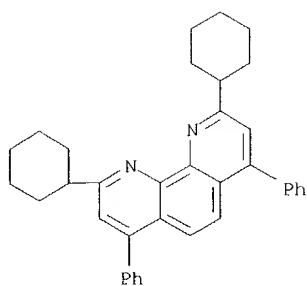


RN 338734-81-9 CAPLUS  
CN 1,10-Phenanthroline, 4,7-diphenyl-2,9-bis(phenylmethyl)- (9CI) (CA INDEX NAME)

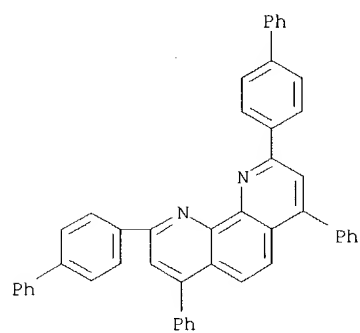


RN 338734-82-0 CAPLUS  
CN 1,10-Phenanthroline, 2,9-dicyclohexyl-4,7-diphenyl- (9CI) (CA INDEX NAME)

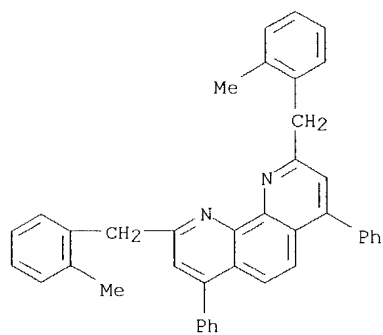
09704968



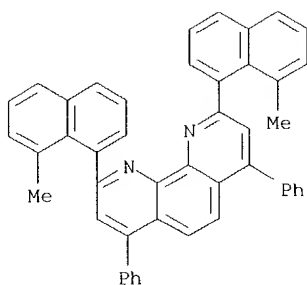
RN 338734-83-1 CAPLUS  
CN 1,10-Phenanthroline, 2,9-bis([1,1'-biphenyl]-4-yl)-4,7-diphenyl- (9CI)  
(CA INDEX NAME)



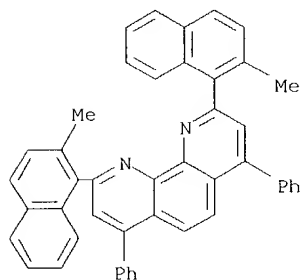
RN 338734-84-2 CAPLUS  
CN 1,10-Phenanthroline, 2,9-bis([2-methylphenyl]methyl)-4,7-diphenyl- (9CI)  
(CA INDEX NAME)



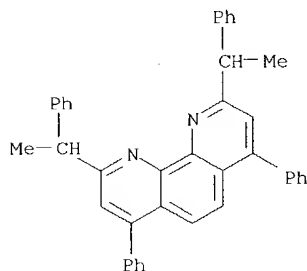
RN 338734-86-4 CAPLUS  
CN 1,10-Phenanthroline, 2,9-bis(8-methyl-1-naphthalenyl)-4,7-diphenyl- (9CI)  
(CA INDEX NAME)



RN 338734-87-5 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(2-methyl-1-naphthalenyl)-4,7-diphenyl- (9CI)  
(CA INDEX NAME)

RN 338734-88-6 CAPLUS

CN 1,10-Phenanthroline, 4,7-diphenyl-2,9-bis(1-phenylethyl)- (9CI) (CA INDEX  
NAME)

L5 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1994:22551 CAPLUS

DN 120:22551

TI Lithium ion-selective electrodes based on 1,10-phenanthroline derivatives

AU Sugihara, Hideki; Okada, Tatsuhiro; Hiratani, Kazuhisa

CS Natl. Inst. Mater. Chem. Res., Higashi, 305, Japan

SO Analytical Sciences (1993), 9(5), 593-7

CODEN: ANSCEN; ISSN: 0910-6340

DT Journal

LA English

AB The preparation of 1,10-phenanthroline derivs. and 4,7-diphenyl-1,10-phenanthroline derivs. as neutral carriers for ion-selective electrodes and the properties of the title electrodes are described in detail. A log K<sub>Li,Na</sub>Pot value of -3.1 was obtained for a Li<sup>+</sup>-selective PVC membrane electrode based on 2,9-dibutyl-1,10-phenanthroline. This value is superior to those reported so far. The electrodes also showed excellent selectivity coeffs. for Li<sup>+</sup> relative to K<sup>+</sup>, Mg<sup>2+</sup>, and Ca<sup>2+</sup>. The effects of substituents at the 2- and 9-positions of the carriers on the selectivity are discussed.

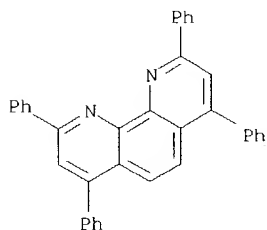
IT 51786-73-3P 151862-67-8P

RL: PREP (Preparation)

(preparation and NMR and comparison of, as neutral carrier in lithium ion-selective electrode)

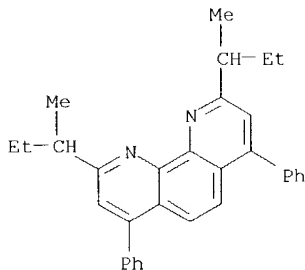
RN 51786-73-3 CAPLUS

CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



RN 151862-67-8 CAPLUS

CN 1,10-Phenanthroline, 2,9-bis(1-methylpropyl)-4,7-diphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 9 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1993:658750 CAPLUS

DN 119:258750

TI Luminescence of rhenium(I) complexes with highly sterically hindered  $\alpha$ -diimine ligands

AU Zipp, Arden P.; Sacksteder, LouAnn; Streich, Julie; Cook, Andrew; Demas, J. N.; DeGraff, B. A.

CS Chem. Dep., State Univ. New York, Cortland, NY, 13045, USA

SO Inorganic Chemistry (1993), 32(24), 5629-32

CODEN: INOCAJ; ISSN: 0020-1669

DT Journal

LA English

AB Several new  $\text{ReL}(\text{CO})_3\text{py}^+$  (py = pyridine, L = substituted phen) complexes were synthesized; they form easily, exhibit excellent luminescent properties and show promise as sensors. The  $\text{O}_2$  quenching consts., luminescence temperature variations, and metal-ligand charge-transfer state energies were investigated. Ph substituents can be used to tune excited-state properties in useful ways and in the 4-, 7-, and 5-positions should make attractive intercalative DNA binders.

IT 151269-14-6

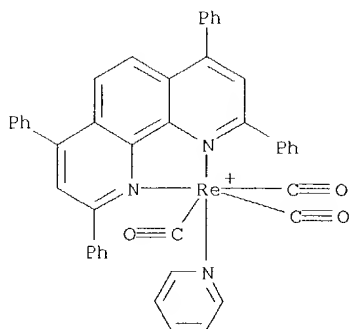
RL: PRP (Properties)

(luminescence lifetime and spectra and charge-transfer excited states of)

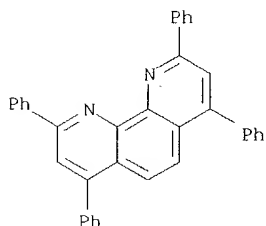
RN 151269-14-6 CAPLUS

CN Rhenium(I+), tricarbonyl(pyridine)(2,4,7,9-tetraphenyl-1,10-phenanthroline-N1,N10)-, (OC-6-33)- (9CI) (CA INDEX NAME)





L5 ANSWER 10 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1983:179244 CAPLUS  
 DN 98:179244  
 TI Direct synthesis of disubstituted aromatic polyimine chelates  
 AU Dietrich-Buchecker, C. O.; Marnot, P. A.; Sauvage, J. P.  
 CS Inst. Chim., Univ. Louis Pasteur, Strasbourg, 67000, Fr.  
 SO Tetrahedron Letters (1982), 23(50), 5291-4  
 CODEN: TELEAY; ISSN: 0040-4039  
 DT Journal  
 LA English  
 OS CASREACT 98:179244  
 AB Treatment of 1,10-phenanthroline with alkyl- or aryllithiums, followed by hydrolysis and rearomatization with MnO<sub>2</sub> gave 2,9-disubstituted products in high yield. E.g., treatment of 1,10-phenanthroline with PhLi in 3:1 C<sub>6</sub>H<sub>6</sub>/Et<sub>2</sub>O followed by hydrolysis and MnO<sub>2</sub> oxidation gave 2,9-diphenyl-1,10-phenanthroline in 70% yield. The method was extended to other aromatic polyimines, e.g. 2,2'-bipyridine.  
 IT **51786-73-3P**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of, by direct regiospecific phenylation)  
 RN 51786-73-3 CAPLUS  
 CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 11 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN  
 AN 1974:95913 CAPLUS  
 DN 80:95913  
 TI 1,10-Phenanthroline derivatives  
 IN Zak, Bohumil  
 SO Czech., 3 pp.  
 CODEN: CZXXA9  
 DT Patent  
 LA Czech  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CS 150747	B	19730917	CS 1971-3494	19710812
PRAI	CS 1971-3494		19710812		

GI For diagram(s), see printed CA Issue.  
 AB The title compds. I (R<sub>1</sub>, R<sub>3</sub> = H, Me, Ph; R<sub>2</sub>, R<sub>4</sub> = H, Me) were prepared by condensation of R<sub>1</sub>CH:CR<sub>2</sub>COR<sub>3</sub> with o-phenylenediamine (II) or 4,5-dimethyl-1,2-phenylenediamine (III). E.g., 1.46 kg II was treated with 4 kg PhCOCH:CHMe in HCl solution at 90-100° to give 500 g 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline. Analogously, III reacted

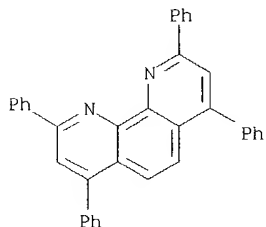
with MeCH:CHCHO and CH<sub>2</sub>:CMe(OEt)<sub>2</sub> to give, resp., 2,5,6,9-tetramethyl- and 3,5,6,8-tetramethyl-1,10-phenanthroline.

IT **51786-73-3P**

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 51786-73-3 CAPLUS

CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)



L5 ANSWER 12 OF 12 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1956:48773 CAPLUS

DN 50:48773

OREF 50:9422f-i,9423a-e

TI Substituted 1,10-phenanthrolines. VIII. 2- and 3-Phenyl derivatives

AU Case, Francis H.; Sasin, Richard

CS Temple Univ., Philadelphia, PA

SO Journal of Organic Chemistry (1955), 20, 1330-6

CODEN: JOCEAH; ISSN: 0022-3263

DT Journal

LA Unavailable

AB cf. C.A. 49, 10959h. Glycerol (18.4 g.) added to 11 g.

8-amino-2-phenylquinoline (I), 9 g. H<sub>3</sub>AsO<sub>4</sub>, 24 cc. concentrated H<sub>2</sub>SO<sub>4</sub>, and 8 cc. H<sub>2</sub>O at 100°, the mixture heated 2 hrs. at 140°, cooled, neutralized with NaOH, and the dried precipitate extracted with boiling C<sub>6</sub>H<sub>6</sub> gives 23.4% 2-phenyl-1,10-phenanthroline, m. 104°. Adding 16 g.

PhCH:CHCHO to 14.6 g. I, 18 g. H<sub>3</sub>AsO<sub>4</sub>, and 40 cc. 85% H<sub>3</sub>PO<sub>4</sub> at 100° at such a rate that the temperature does not rise above 120°, heating the mixture 2 hrs. at 120-35°, pouring it onto ice, and neutralizing it with KOH gives 1.2 g. 2,9-diphenyl-1,10-phenanthroline, m. 185-6°.

Refluxing 63 g. HOCPh(CH<sub>2</sub>Cl)<sub>2</sub> and 56 g. anhydrous NaOAc in 85 cc. absolute EtOH, pouring the mixture onto ice, extracting with Et<sub>2</sub>O, and distilling the residue of the Et<sub>2</sub>O extract gives 32.5 g. crude HOCPh(CH<sub>2</sub>OAc)<sub>2</sub>, b<sub>10</sub> 150-60°, which (32 g.), added slowly to 13.5 g. o-O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NH<sub>2</sub>, 13.5 g. H<sub>3</sub>AsO<sub>4</sub>, 42 cc.

concentrated H<sub>2</sub>SO<sub>4</sub>, and 12 cc. H<sub>2</sub>O with stirring below 120°, and the mixture heated 2 hrs. at 120-30°, poured onto ice, made alkaline, and extracted with C<sub>6</sub>H<sub>6</sub> gives 1.2 g. 8-nitro-3-phenylquinoline (II), m. 110-20°.

II is also obtained in 3.5-g. yield from a suspension of 9 g. paraformaldehyde in 55.2 g. of a 50% solution of PhCH<sub>2</sub>CHO in EtOH added to 13.8 g. o-O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NH<sub>2</sub>, 11.5 g. H<sub>3</sub>AsO<sub>4</sub>, and 10 g. anhydrous ZnCl<sub>2</sub> in 200 cc. concentrated HCl, and the mixture worked up in the usual way. Adding 6.5 g. Fe powder to 10.5 g. II in 100 cc. 50% AcOH at 60°, heating the mixture 1 hr. on a steam bath, neutralizing it with NaOH, and extracting with Et<sub>2</sub>O gives 7.5 g. 8-amino-3-phenylquinoline (III), m. 74-5° (Ac derivative, m. 147-8°).

Adding 3.8 cc. acrolein to 5.8 g. III, 8 g. H<sub>3</sub>AsO<sub>4</sub>, and 40 cc. 85% H<sub>3</sub>PO<sub>4</sub> at 100° and heating the mixture 1 hr. at 100° gives 1.7 g. 3-phenyl-1,10-phenanthroline (IV) [monopicrate (IVa), m. 221-2°; mono-HCl salt, prepared from IVa, m. 210-11°]. Keeping 43.2 g. 8-aminoquinoline, 57.6 g. EtO<sub>2</sub>CCHPhCHO (V), and 2 drops AcOH 3 days in a vacuum desiccator, adding the oil formed to 300 cc. refluxing Dowtherm A (VI), and refluxing it 2 hrs. gives 42% 4-hydroxy-3-phenyl-1,10-phenanthroline, m. 235-6° which (10.88 g.), refluxed 3 hrs. with 20 g. PCl<sub>5</sub> in 30 cc. POCl<sub>3</sub>, gives 25.9% 4-Cl analog, m. 149-50°; 4-Br analog (VII), prepared similarly with PBr<sub>3</sub>, 22.3%, needles, m. 158-9°.

Reduction of 3 g. VII with 1 g. Raney Ni in 10 cc. 10% NaOH and 50 cc. absolute EtOH 2 hrs. gives IV, b<sub>1</sub> 235-8° (picrate, m. 221-2°). Treating 10.8 g. o-C<sub>6</sub>H<sub>4</sub>(NH<sub>2</sub>)<sub>2</sub> with 38.4 g. V and 2 drops AcOH 3 days in a vacuum desiccator, and refluxing the oil formed in 300 cc. VI 12 hrs. gives 33.5% 4,7-dihydroxy-3,8-diphenyl-1,10-phenanthroline, m. 337-8°, which, treated with PCl<sub>5</sub>-POCl<sub>3</sub>, yields 26.7% 4,7-di-Cl analog, m. 235-6°; 4,7-di-Br analog (VIII), 18.4%, m. 240-1°. Reduction of 2.5 g. VIII with Raney Ni gives 59% 3,8-diphenyl-1,10-phenanthroline, m. 190-1°. Keeping 22.2 g.

8-amino-6-phenylquinoline, 19.2 g. V, and 2 drops AcOH 3 days in a vacuum desiccator and refluxing the reaction product in VI gives 29.3% 4-hydroxy-3,5-diphenyl-1,10-phenanthroline, m. 248-9°. Adding slowly 15 g. BzCH<sub>2</sub>CH<sub>2</sub>Cl to 13.5 g. 8-amino-4-phenylquinoline, 17 g. H<sub>3</sub>AsO<sub>4</sub>, and 57 g. 85% H<sub>3</sub>PO<sub>4</sub> at 100° and heating the mixture 2 hrs. at 120° gives 58.8% 4,7-diphenyl-1,10-phenanthroline (IX), m. 216-17°, which is also obtained in 16.8% yield by a Yale-type Skraup reaction (C.A. 42, 2976a). Adding 0.6 of a PhLi solution (from 1.1 g. Li and 14 g. PhBr) in 50 cc. Et<sub>2</sub>O to 3.5 g. 4,7-dimethyl-1,10-phenanthroline (X) in 75 cc. C<sub>6</sub>H<sub>6</sub> in a N atmospheric, distilling off the Et<sub>2</sub>O, refluxing the C<sub>6</sub>H<sub>6</sub> solution 3 hrs., adding 15 cc. PhNO<sub>2</sub>, distilling off the C<sub>6</sub>H<sub>6</sub>, heating the mixture 4 hrs. at 100°, and removing the PhNO<sub>2</sub> by steam distillation gives 33% 4,7-dimethyl-2,9-diphenyl-1,10-phenanthroline, m. 259-60°. In a similar experiment with X replaced by IX, 29.3% 2,4,7,9-tetraphenyl-1,10-phenanthroline, m. 318-19°, is obtained.

IT **51786-73-3**, 1,10-Phenanthroline, 2,4,7,9-tetraphenyl-  
 (preparation of)  
 RN 51786-73-3 CAPLUS  
 CN 1,10-Phenanthroline, 2,4,7,9-tetraphenyl- (9CI) (CA INDEX NAME)

